

Appl. No. 10/810,309  
Amdt. Dated July 27, 2006  
Reply to Office Action of April 28, 2006

Attorney Docket No.81716.0122  
Customer No.: 26021

**Listing of Claims:**

1. (Canceled)

2. (Previously presented) A semiconductor apparatus comprising:  
a substrate made of a diboride single crystal expressed by a chemical formula  $XB_2$ , in which X includes at least one of Ti, Zr, Nb and Hf,  
wherein an angle  $\theta_1$  formed by a normal line of a principal surface of the substrate and a normal line of a (0001) plane of the substrate is  $0^\circ < \theta_1 \leq 0.55^\circ$ ;  
a semiconductor buffer layer formed on the principal surface of the substrate and made of  $(AlN)_x(GaN)_{1-x}$  ( $0 < x \leq 1$ ); and  
a nitride semiconductor layer formed on the semiconductor buffer layer, including at least one kind or plural kinds selected from among 13 group elements and As.

3. (Canceled)

4. (Original) The semiconductor apparatus of claim 2, wherein the substrate is of  $ZrB_2$  or  $TiB_2$ .

5. (Canceled)

6. (Original) The semiconductor apparatus of claim 2, wherein the substrate is a solid solution containing one or a plurality of impurity elements of 5 atom % or less, the one or a plurality of impurity elements being selected from a group

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consisting of Ti, Cr, Hf, V, Ta and Nb when the substrate is of  $ZrB_2$ , or selected from a group consisting of Zr, Cr, Hf, V, Ta and Nb when the substrate is of  $TiB_2$ .

7. (Canceled)

8. (Original) The semiconductor apparatus of claim 2, wherein the semiconductor buffer layer is AlN.

9. (Canceled)

10. (Original) The semiconductor apparatus of claim 8, wherein the thickness of the semiconductor buffer layer made of AlN is 10 to 250 nm.

11. (Original) The semiconductor apparatus of claim 2, wherein the thickness of the semiconductor buffer layer made of  $(AlN)_x(GaN)_{1-x}$  is within a range of 10 to 100 nm.

12. (Original) The semiconductor apparatus of claim 2, wherein x of the semiconductor buffer layer made of  $(AlN)_x(GaN)_{1-x}$  is  $0.1 \leq x \leq 1$ .

13. (Original) The semiconductor apparatus of claim 2, wherein x of the semiconductor buffer layer made of  $(AlN)_x(GaN)_{1-x}$  is  $0.4 \leq x \leq 0.6$ .

14-18. (Canceled)

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19. (Original) The semiconductor apparatus of claim 2, wherein the substrate is eroded and removed by etching.

20-32. (Canceled)